

Oligohydramnios is Associated with Poor Pregnancy Outcome

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ABSTRACT

Objective: To determine the association between amniotic fluid index and fetal outcome in low risk pregnancies at term, particularly in relation to mode of delivery, fetal morbidity and mortality.

Design: Observational as well as a comparative study

Place and duration of study: Department of Obstetrics & Gynaecology Unit I, Sir Ganga Ram Hospital Lahore from 15th Oct, 2004 to 14th Oct, 2005.

Patients and methods: During the study period of one year, one hundred patients were studied. These patients had singleton pregnancy with cephalic presentation at term. Amniotic fluid index (AFI) was performed by ultrasound on these patients, using the standard technique. On the basis of AFI measurement, patients were divided into two groups; those with AFI less than or equal to 5cm (group I) and those with AFI more than 5cm (group II).

Results: The selected outcomes showed variations in both the groups. Sixty eight percent (68%) patients showed values of AFI more than 5cm and thirty two percent patients showed values of AFI less than or equal to 5cm. Induction of labour with prostaglandins was carried out in 41% of the group I patients and 22% of the group II patients. Meconium staining of amniotic fluid was observed more in group I, as compared to group II (31% Vs 8.8%). Thirty seven (37%) of the patients in group I had cesarean section due to foetal distress, compared to twelve percent patients in group II. It was statistically significant ($P < 0.05$). The low one minute and five minute APGAR scores were observed in group I, than in group II (6.2% Vs 4.4% and 3.1% Vs 1.4% respectively). More babies in group I required resuscitation and admission to the neonatal intensive care unit, as compared to group II.

Conclusion: It was observed that amniotic fluid index of less than or equal to 5cm (oligohydramnios), is associated with an increased risk of fetal distress, caesarean delivery, low APGAR scores and neonatal intensive care unit admissions. So, measurement of amniotic fluid index in low risk pregnant women at term, can identify parturients with an increased risk of labour complications.

Keywords: Amniotic fluid index, low risk pregnancy, Fetal outcome.

INTRODUCTION

The ultrasonographic assessment of decreased amniotic fluid volume has been recognized as a predictor of adverse perinatal outcome. The presence of oligohydramnios which is defined as an amniotic fluid index less than or equal to 5cm, has been correlated with increased rates of perinatal mortality, passage of meconium, caesarean delivery for fetal distress, low APGAR scores, need for neonatal resuscitation and intensive care unit admission^{1,2}.

The finding of abnormal fluid volume on ultrasound is frequently used to identify fetuses at risk of having adverse outcomes as suggested by the finding of abnormal fluid volumes. Amniotic fluid index was described by Phelan et al in 1987, as the sum of largest vertical pockets of amniotic fluid in all the four quadrants of uterus. This technique of assessing amniotic fluid volume has become increasingly popular in obstetric practice.

Reduced amniotic fluid volume has been circumstantially associated with a variety of poor pregnancy outcomes such as perinatal death fetal

distress in labour, and poor infant condition at birth^{5,6,7}. Obstetricians have increasingly resorted to induction of labour or antepartum testing of fetal health in pregnancies complicated by decreased amniotic fluid volume.

We sought to assess the significance of AFI for pregnancy outcomes especially the mode of delivery fetal morbidity & mortality.

PATIENTS AND METHODS

This study was carried out in the Department of Obstetrics & Gynaecology, Sir Ganga Ram Hospital Lahore, from 15th Oct, 2004 to 14th Oct, 2005. It was an observational as well as comparative study. During this study, one hundred patients were selected, at term (37-42 wks) with cephalic presentation and fetus with no anomalies. Amniotic fluid index was performed on these patients. All outcome variables of these pregnancies were recorded on printed proformas. Outcome variables included induction of labour, vaginal delivery, caesarean section for fetal distress, one minute APGAR score of less than or equal to 7, need for resuscitation and neonatal intensive care unit admission. Amniotic fluid index measurement was

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performed in the Radiology Department of SGRH by expert sonographers.

All data was analyzed with statistical package program SPSS version 10. We evaluated the association of amniotic fluid index with fetal outcome in term pregnancies and then using t-test of proportions, evaluated whether it was statistically significant or not. Different outcome variables (mentioned above) in pregnancies with oligohydramnios were compared with those with an AFI more than 5cm. The significance of difference or comparison of means was assessed using t-test of proportions. Probability values of less than or equal to 0.05 were considered significant.

RESULTS

One hundred patients were studied in one year period from 15th Oct, 2004 to 14th Oct, 2005. Patients with uncomplicated singles pregnancy were recruited between 37-42 wks of ultrasound. On the basis of AFI measurement, patients were grouped into two: Group I included patients who had AFI less than or equal to 5cm and group II included patients with AFI more than 5cm. Sixty eight percent (68%) patients showed AFI above 5cm and thirty two percent (32%) patients showed AFI less than 5cm (oligohydramnios) Table I shows no of patients according to gestation age; 38% patients were between 37-39+ wks of gestation and 62% patients were between 40-42 wks of gestation.

Table I: No of patients according to gestational age

Gestational age	No	Percent
37-39+ wks	38	38
40-42 wks	62	62
Total	100	100

Induction with prostaglandins was carried out in 41% of group I patients and 22% of group II patients. Table II shows distribution of cases according to the onset of labour.

Table II

Onset of labor	Group I	Group II	Significance (P-values)
Spontaneous	19(59%)	53(78%)	
Induction	13(41%)	15(22%)	T = 1.89
Total	32(100%)	68(100%)	p> 0.05*

Meconium staining of amniotic fluid was seen in 31% of the patients in group I, as compared to 8.8% in group II, after rupture of membranes or noted intraoperatively. Careful observation of 1 minutes and 5 minutes. APGAR scores was done in the two groups. Low 1 minutes and 5 minutes APGAR scores were observed in group I than in group II. More babies in group II required resuscitation and admission to neonatal intensive care unit.

Table III: Distribution of cases according to the colour of liquor

Colour of liquor	Group I	Group II	Significance (P-values)
Clear	22(69%)	62(92%)	
Meconium	10(31%)	6(8%)	P< 0.05**
Total	32(100%)	68(100%)	

There was increased rate of cesarean delivery in group I, as compared to that in group II (37% Vs 12%). Table IV shows delivery outcome variables between the two groups. In all the cases, fetal distress was the indication for c. section.

Table IV: Delivery outcome variables between the two groups

Mode of delivery	Group I	Group II	Significance (P-values)
Vaginal	20(63%)	60(88%)	P>0.05*
C Section	12(37%)	8(12%)	P< 0.05**
Total	32(100%)	68(100%)	

Table V: Neonatal outcome variables between the two groups

Neonatal outcome	Group I	Group II	Significance (P-values)
APGAR score <6 at 1 min	2(6.2%)	3(4.4%)	P>0.05*
APGAR score <7 at 5 min	1(3.1%)	1(1.4%)	P>0.05*
Resuscitation	1(3.1%)	1(1.4%)	P>0.05*
NICU admission	1(3.1%)	1(1.4%)	P>0.05*
Mortality	1(3.1%)	Zero	P>0.05*

* Not significant,

** Significant

DISCUSSION

Amniotic fluid is one of the major indicators of fetal well being. Ultrasonographic estimation of amniotic fluid index is a critical component of antenatal fetal surveillance. In term pregnancies, oligohydramnios (defined by ultrasonographic determination of AFI less than or equal to 5cm), has been suggested as an indication for delivery^{8,9}. In high risk pregnancies, oligohydramnios is frequently used to identify fetuses at risk of an adverse outcome^{10,11}.

The purpose of this study was to evaluate the effect of ligohydramnios on the mode of delivery and fetal outcome. Low risk pregnancies at term were included in this study. 32% patients fulfilled the criteria of oligohydramnios.

Induction of labor was performed in 41% of the group I patients as compared to 22% of the group II patients. These results are comparable to the study carried out by Rainford M et al in Georgetown University Hospital, Washington which showed that in uncomplicated pregnancies at term, an amniotic fluid index of less than or equal to 5 cm, is associated with

an increased risk of labor induction. Similar was observed by Robert D et al¹².

The association of AFI with meconium staining of liquor was also studied. In this study, percentage of meconium stained amniotic fluid was higher (31%) in group I, while it was lower (8%) in group II (Table III). It was statistically significant ($P<0.05$).

Myles et al carried out a study in low risk patients at term and found that in patients with AFI less than or equal to 5cm, there is significantly higher risk of meconium stained amniotic fluid¹³. The mode of delivery was also influenced by AFI. Percentage of patients undergoing caesarean delivery for fetal distress was higher (37%) in group I and lower (12%) in group II (Table IV). It was statistically significant ($P<0.05$). Our results, are comparable to the study carried out by Ghosh et al in Sweden, in which 333 low risk pregnancies at term, were assessed by the measurement of AFI. A 50% increase in emergency cesarean section for fetal distress was observed in patients with values of AFI less than or equal to 5cm, and this fetal distress was confirmed by the estimation of umbilical arterial PH after delivery^{14,15,16}. Similar results were obtained by Myles TD et al and Robert D et al^{12,13}.

Umbilical arterial Ph after delivery can be used as an objective means to assess neonatal acidosis. This was not performed in our study. Recent evidence indicates that injury related to hypoxic ischemic encephalopathy doesn't occur unless the arterial Ph is less than 7.0¹⁷.

Careful observation of the 1 minute and 5 minutes. APGAR scores in the two groups revealed low APGAR scores in group I. these results are comparable to other studies^{18,19}.

CONCLUSION

This study concluded that an amniotic fluid index less than or equal to 5 cm is associated with an increased risk of labour induction, fetal distress, caesarean delivery, low APGAR scores and neonatal intensive care unit admission.

So, measurement of amniotic fluid index in low risk pregnant women at term can identify parturient with an increased risk of labour complications. However, large randomized controlled trials are required to establish the routine use of AFI in low risk pregnancies.

REFERENCES

1. Rainford M, Adain R, Scialliar, Gehin Dimi A. Amniotic fluid index in the uncomplicated pregnancy at term, prediction of outcome. *J Reprod Med* 2001; 46: 589.
2. Everett F, Magann MD, Suneet P, Dorota A, Doherty Chauhan MD et al. Predictability of intrapartum and neonatal outcomes with the amniotic fluid index, single

- deepest pocket and a dye determined amniotic fluid volume. *Am J Obstet Gynecol* 2003; 188: 1523-28.
3. Chamberlain PF, Manning FA, Morrison I, et al. Ultrasound evaluation of amniotic fluid volume. *Am J Obstet Gynecol.* 1984; 150: 245-249.
4. Chamberlain PF, Manning FA, Morrison I et al. Ultrasound evaluation of amniotic fluid volume II the relationship of increased amniotic fluid volume to perinatal outcome. *Am J Obstet Gynecol.* 1984; 150: 250-254.
5. Moore TR, Cayle JE. The amniotic fluid index in normal human pregnancy. *Am J Obste Gynecol.* 1990;162:1168-1173.
6. Seeds AE. Current Concepts of amniotic fluid dynamics. *Am J Obstet Gynecol.* 1980;138:575-586.
7. Pritchard JA. Deglutition by normal and anencephala fetures. *J Obstet Gynecol.* 1965; 25:289-298.
8. Locatelli A, Zagarella A, TOSOL, ASSI F, Ghidni A, Biffi A. Serial assessment of amniotic fluid index in uncomplicated term pregnancies: prognostic value of amniotic fluid reduction. *J Matern Fetal Neonatal Med.* 2004 Apr; 15(4): 233-6.
9. Chauhan SP, Roberts WE, Martin JN Jr, MagannE Morrison JC. Amniotic fluid index in normal pregnancy. *J MISS state Med.* 1999 Feb; 40: 43-6.
10. Alfirevic Z, Luckas M, Walkinshan SA, McFarlane curran R. A randomized comparison between amniotic fluid index and maximum pool depth in the monitoring of post-term pregnancy. *Br J obstet Gynecol.* 1997; 140:207-11.
11. Magann EF, Chauhan SP, Bofill JA, Martin JN. Comparability of the amniotic fluid index and single deepest pocket measurements in clinical practice. *J Matern Fetal Med.* 2002; 12: 291-97.
12. Roberts D, NWOSU EC, Walkinshaw SA. The fetal outcome in pregnancies with isolated reduced amniotic fluid volume in the Hird trimester. *J perinat Med.* 1998; 26(5): 390-5.
13. Myles TD, Santolaya, Forgas J. Normal ultrasonic evaluation of amniotic fluid in low risk patients at term. *J Reprod Med.* 2002 Aug; 47 (8): 621-4.
14. Ghosh G, Marralk, Gudmundsson S. Amniotic fluid index in low risk pregnancy s an admission test to the labour ward. *J perinatal* 2002; 22:282-85.
15. Thornton JG, lilford R.J. Do we need randomized trials of antenatal tests of fetal well being. *Br J obstet Gynecol* 1993;100: 197-200.
16. Hoskins IA, Frieden FJ, Young BK. Variable decelerations in reactive non-stress test with decreased amniotic fluid index predict fetal compromise. *An J obstet Gynecol.* 1991; 165:1094-8.
17. American college of obstetricians and Gynaecologists. Umbilical artery blood acid base analysis. Washington: The college; 1995; technical Bulletin No. 216.
18. Ajayi RA, soothill PW. Ultrasound assessment of amniotic fluid volume: a comparison of the single deepest pool and amniotic fluid index to predict perinatal morbidity. *Aust NZJ obstet Gynecol.* 2003; 43:75-77.
19. Morris JM, Thompson K, Smithey J, Gaffery G, Cooke I, Chamberlain P, et al. The usefulness of ultrasound assessment of amniotic fluid in predicting adverse outcome in prolonged pregnancy: a prospective blinded observational study. *JGOG* 2003; 110: 989-94.

